

The Scientific Revolution



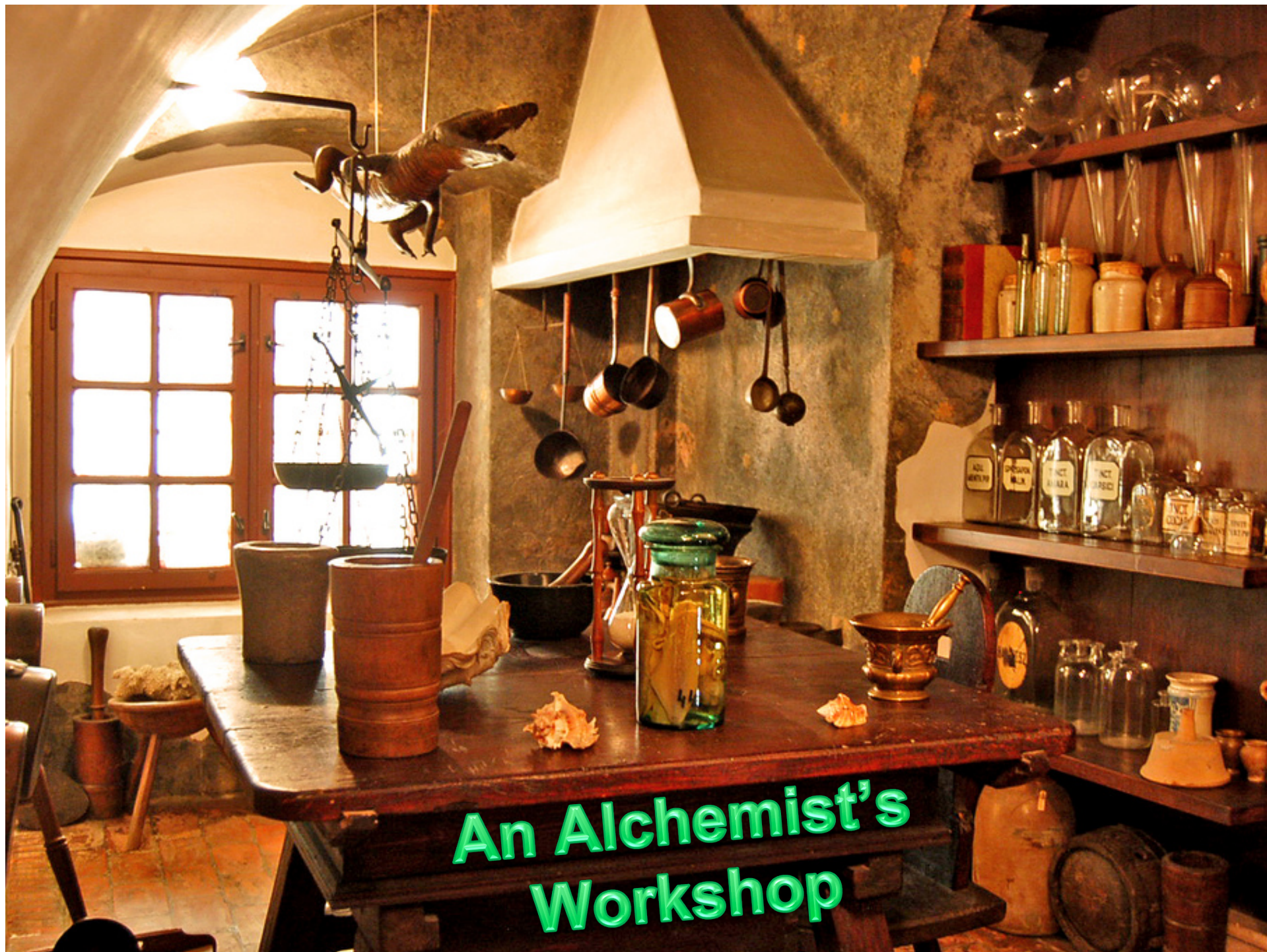
Superstition:

The Mother of Science

Alchemy



Chemistry



**An Alchemist's
Workshop**

1650-1720

These years saw the biggest
advances in science since the
Greeks.

Why so long without advances?

There is a long gap between ancient scientists such as Aristotle, Galen, and Ptolemy and the Scientific Revolution (nearly 2,000 years).



Why???

Why so long without advances?

1. The Catholic Church

- The Classic View
- *Not the only culprit*



Other Explanations:

2. Ancient Science was very advanced.

3. Printing Press

- allowed scientists to communicate

4. Limited Mathematics

- calculus was invented later

5. Limited technology

- no telescopes, microscopes

6. Natural Science not emphasized in medieval universities

- Church Controlled

Center of the Universe?

Ptolemy

(83-161 A.D.)

(Roman) Egypt



***GEO*centric
Theory**

Copernicus

(1473-1543)

Poland

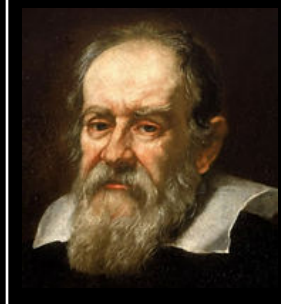


***HELIO*centric
Theory**

Galileo

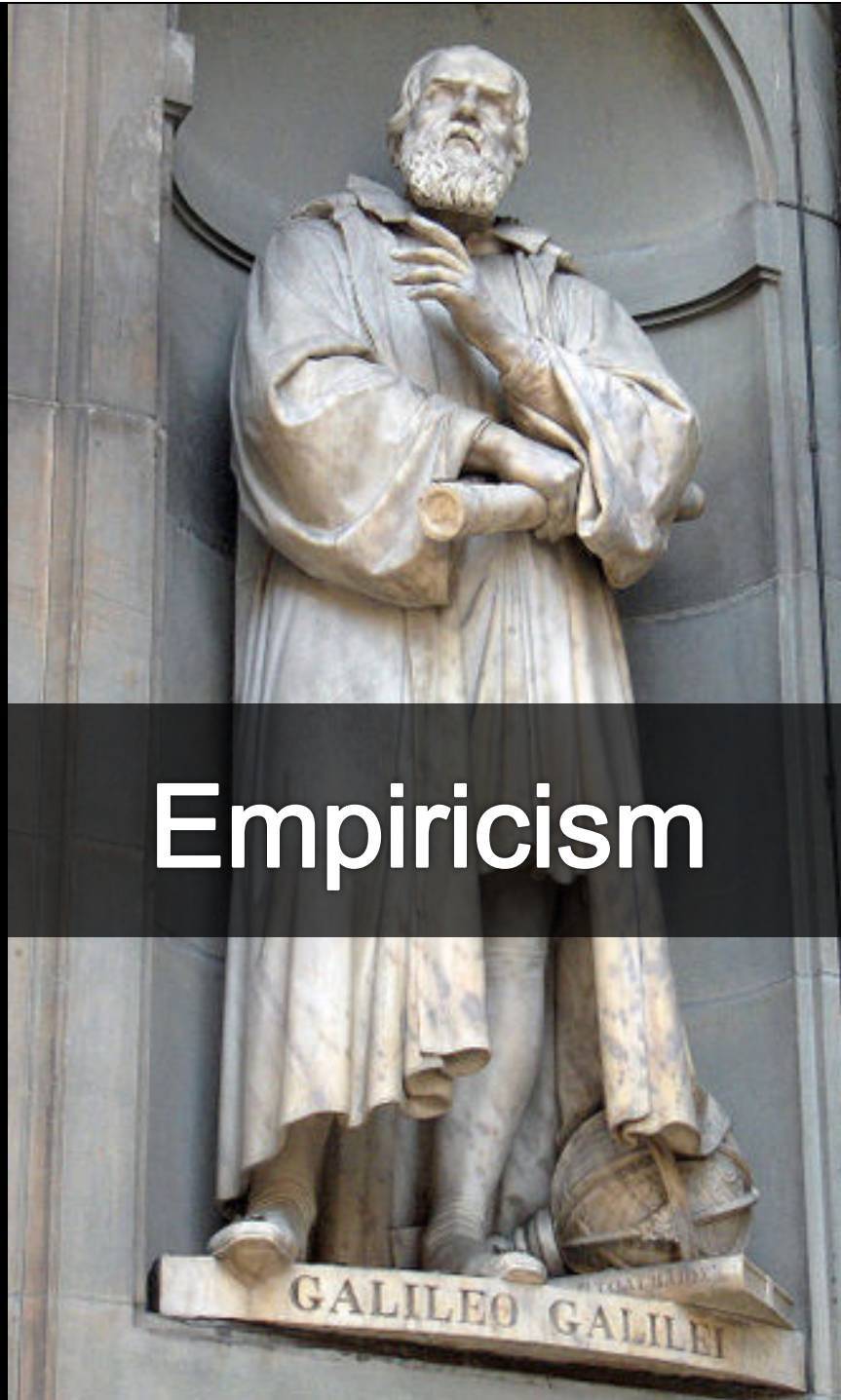
(1564-1642)

Italy



CONFIRMED
***Helio*centric Theory**

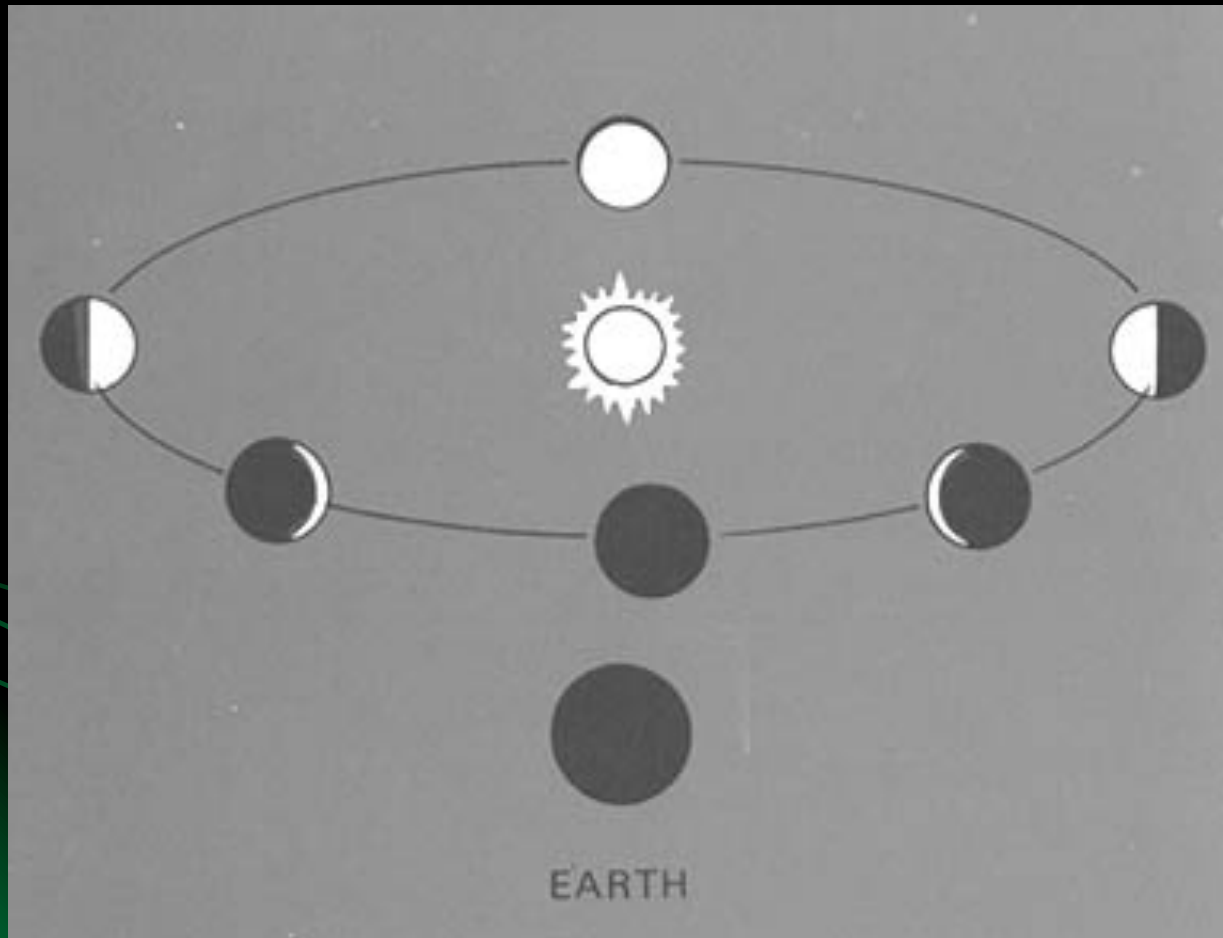
Empiricism



Empiricism

- Theory that all knowledge is derived from sense-experience
- All concepts originate in experience

Empiricism



Galileo improves telescope,
observes Venus



Geocentric View:

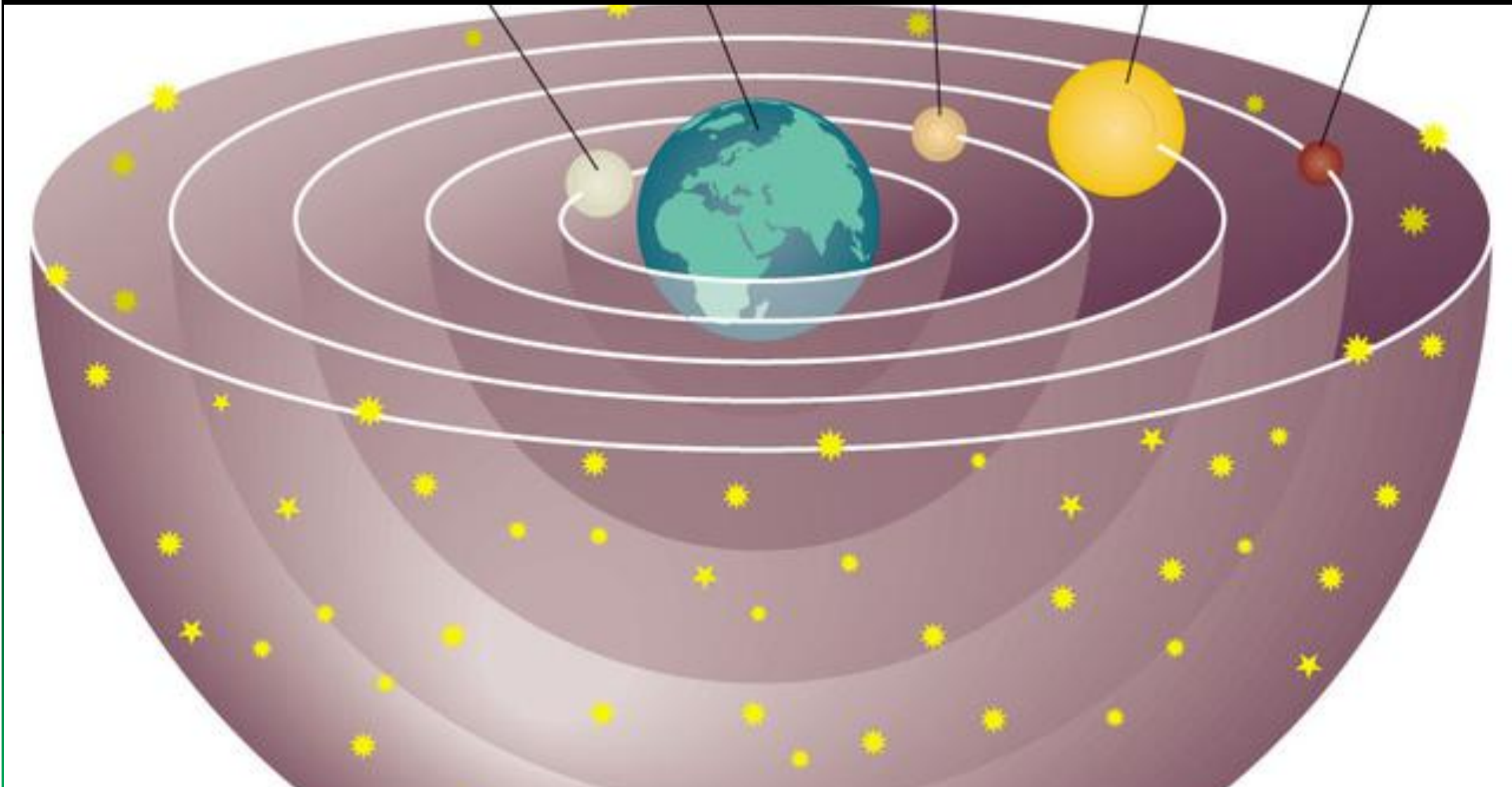
Moon

Earth

Venus

Sun

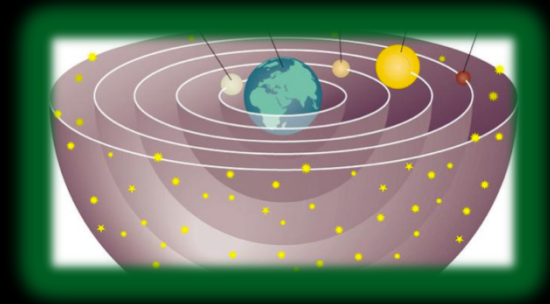
Mars



Pre-Scientific Revolution

What was the general world-view before the Scientific Revolution?

- God is sovereign
- accept the unseen by faith alone
- Theology was based on Aristotle and Ptolemy

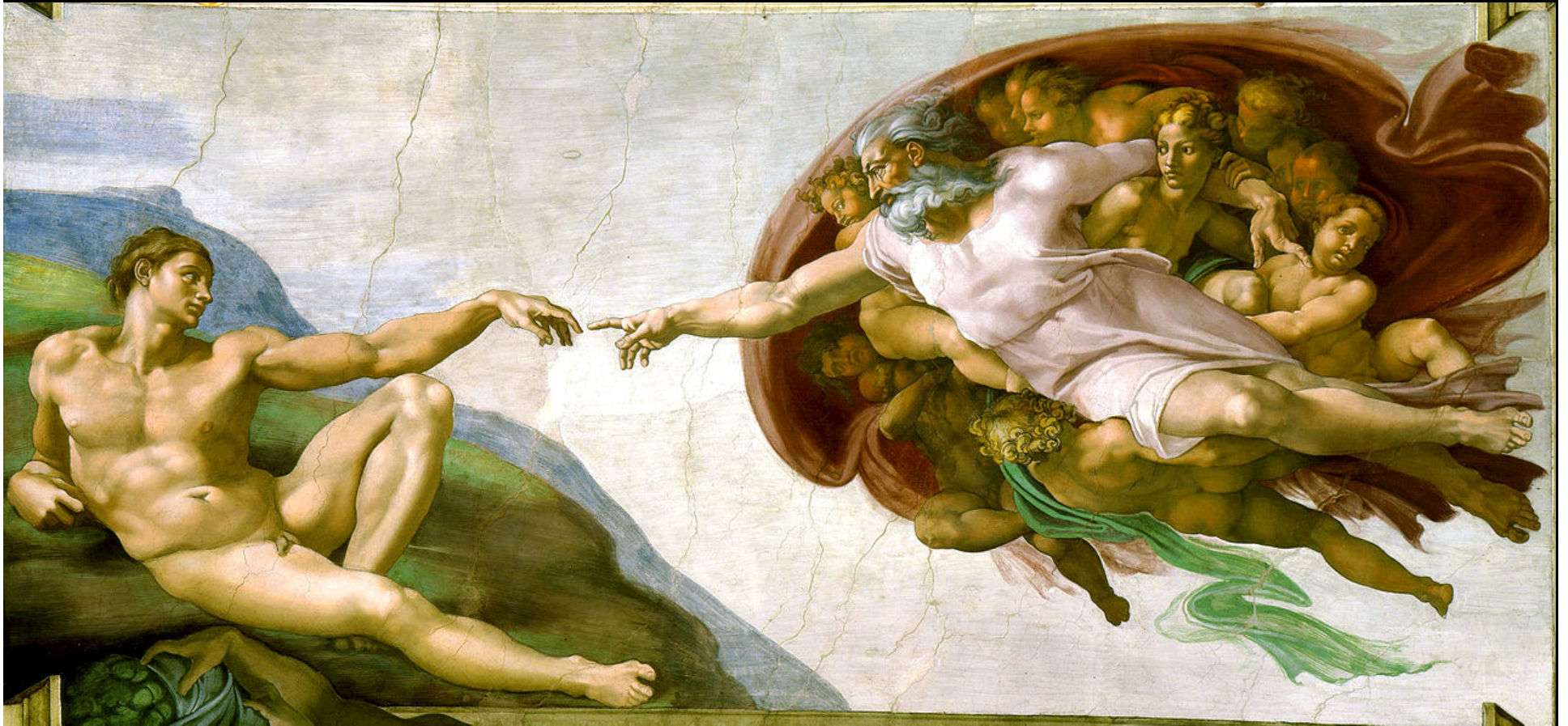


Science vs. the Church?

- Galileo tried by Church officials-found a heretic
- Spent rest of life under house arrest
- Recants
 - Genuine?
- Tension between the Church and Science?



Importance



Science vs. Religion?

Sir Francis Bacon

- 1561-1626
- England

**“A little philosophy
inclineth man’s mind to
atheism; but depth in
philosophy bringeth
men’s minds about to
religion.”**



The Human Body

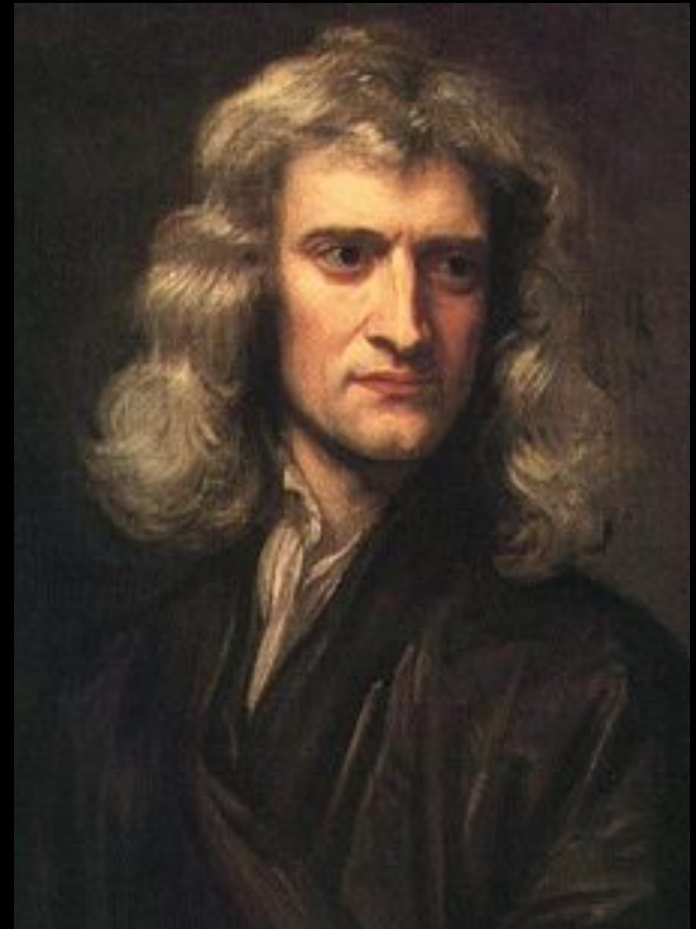
Andreas Vesalius

- Belgium (1514-1564)
- Experiments on Cadavers



Sir Isaac Newton

- 1643-1727
- Universal Gravitation
 - Dependent on heliocentric theory
- Laws of Motion
- Beginnings of Calculus



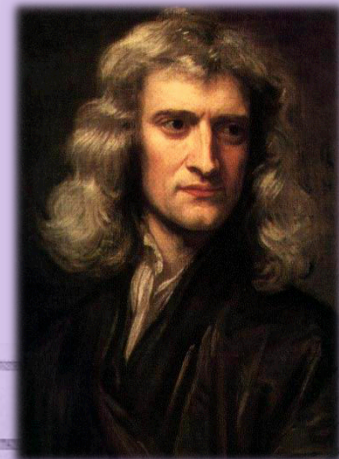
Sacred Geometry



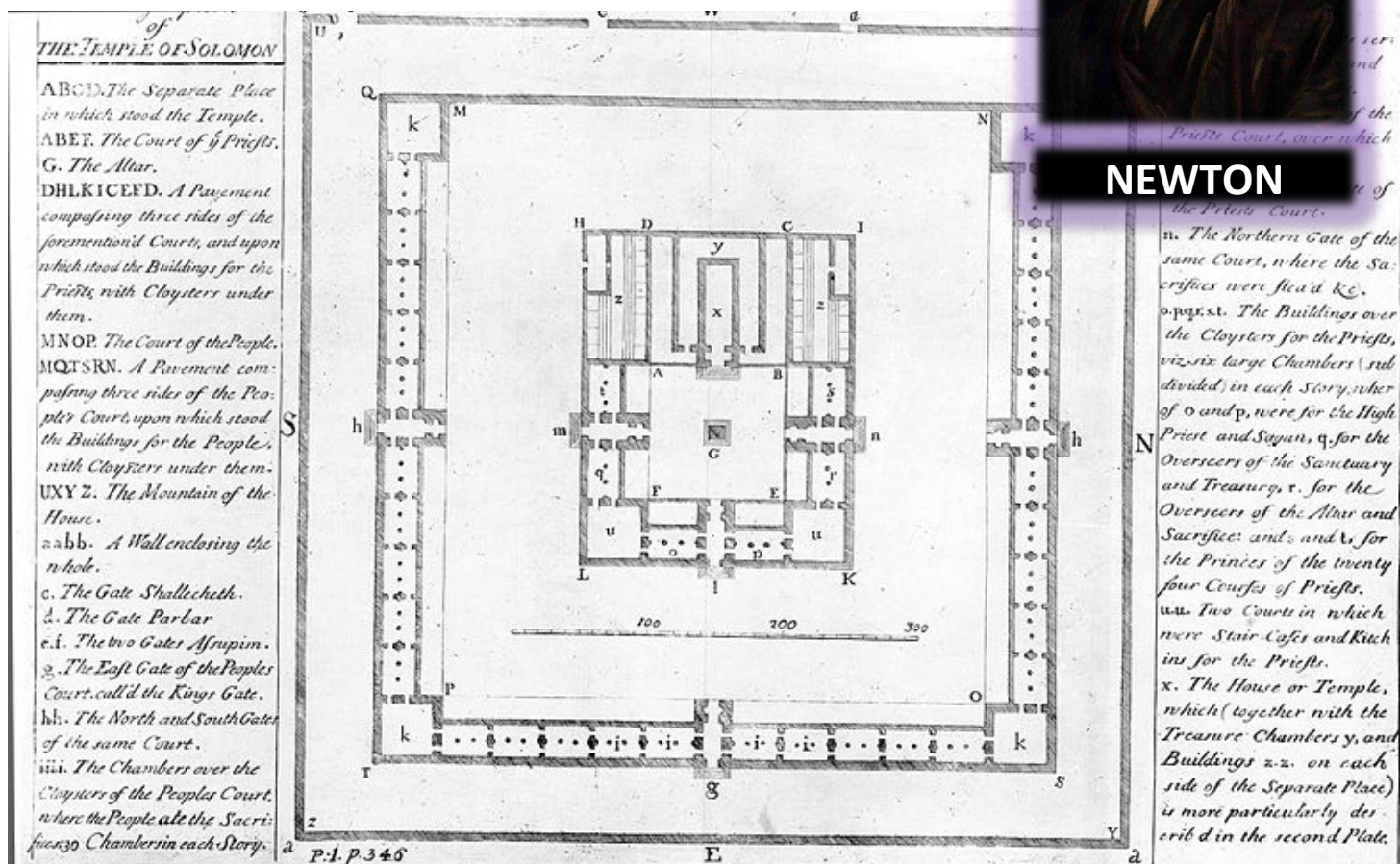
Knights
Templar



Freemasonry



NEWTON



SACRED GEOMETRY

- **Sacred geometry** is the geometry used in the design and construction of [religious structures](#).
- Many forms observed in nature can be related to **GEOMETRY**.
- Newton noted that Solomon's temples' measurements given in the Bible are mathematical problems
- Newton believed that the temple was designed by King Solomon with ***privileged eyes and divine guidance***

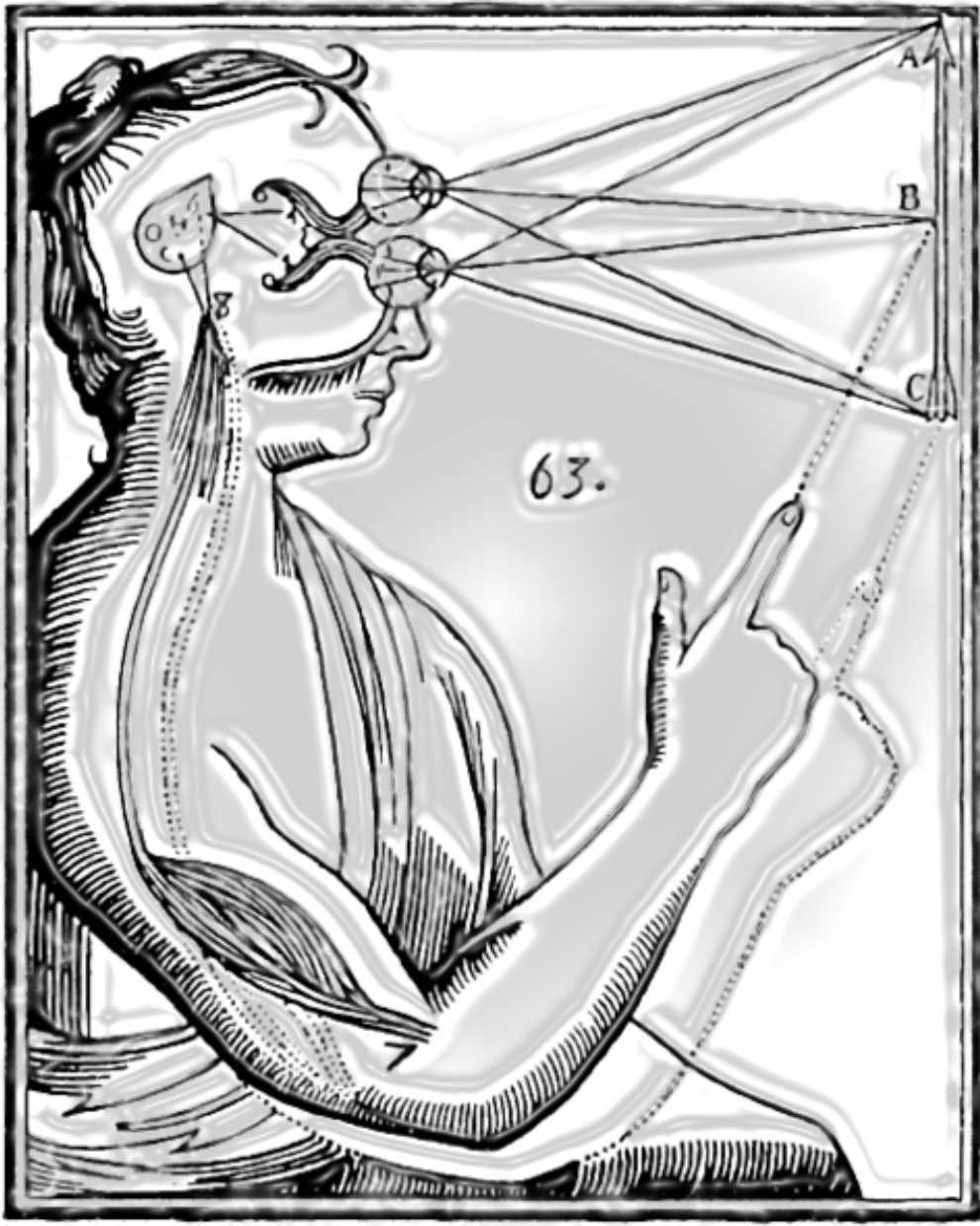
Rene Descartes

- French Philosopher and Mathematician
- Cartesian Dualism
- “Cogito ergo sum.”
“I think, therefore I am.”



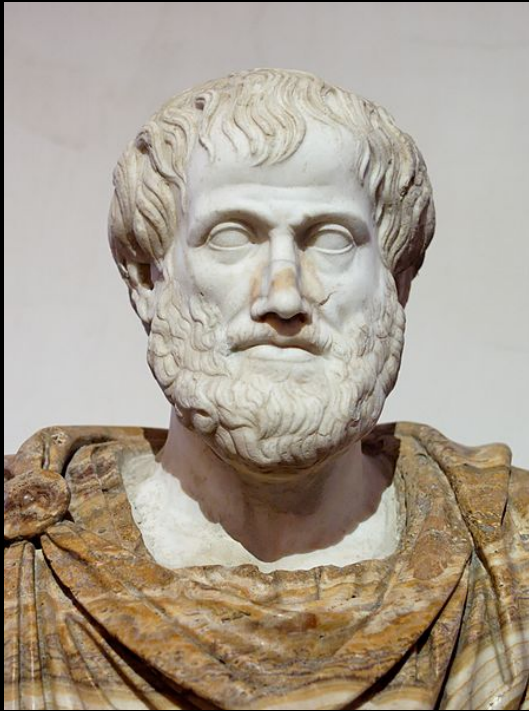
Cartesian DUALISM

The mind and
the body are
separate.



René Descartes's illustration of dualism. Inputs are passed on by the sensory organs to the epiphysis in the brain and from there to the immaterial spirit.

Deductive vs. Inductive Reasoning



Aristotle (Ancient Greek Philosopher)

DEDUCTIVE REASONING

Start with a **premise**

Valid until disproven



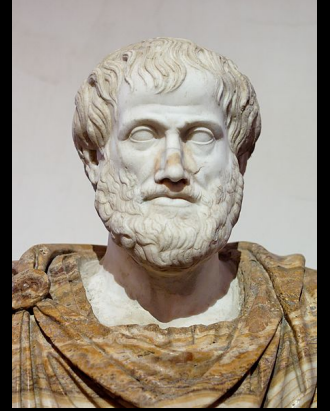
Sir Francis Bacon

INDUCTIVE REASONING

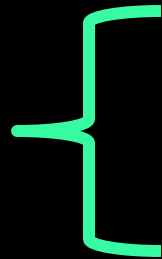
Start with **observations**

**Something must be
PROVEN in order to be true**

Deductive Reasoning



Premises



1. All men are mortal.
2. Socrates is a man.

Conclusion



- Therefore,
3. Socrates is mortal.

Innocent Until Proven Guilty



**Start With
GENERALIZATIONS**

Conclusions are
drawn from
generalizations.

DEDUCTIVE

INDUCTIVE

Start With
OBSERVATIONS

Conclusions are
drawn from a series
of observations.



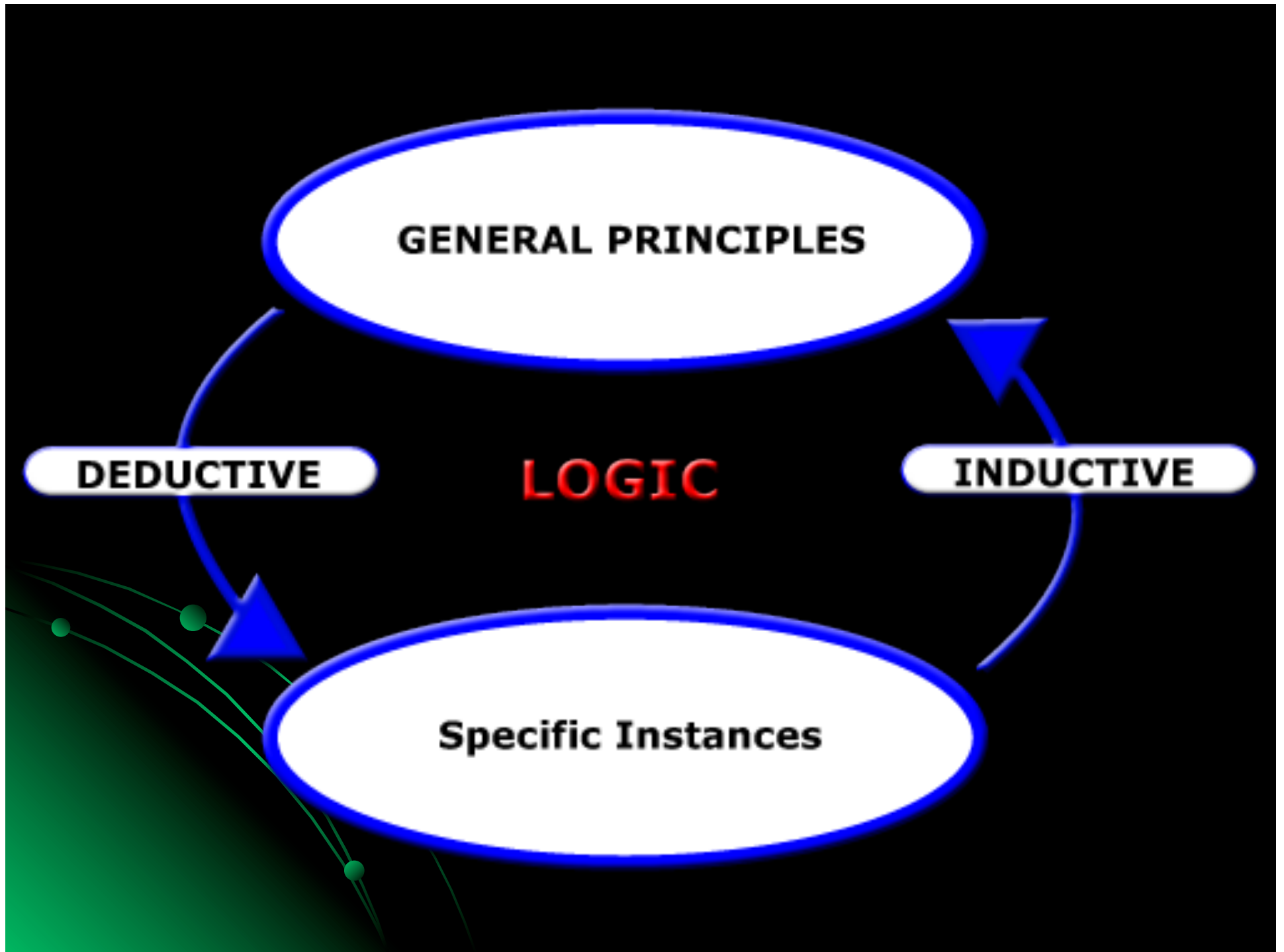
GENERAL PRINCIPLES

DEDUCTIVE

LOGIC

INDUCTIVE

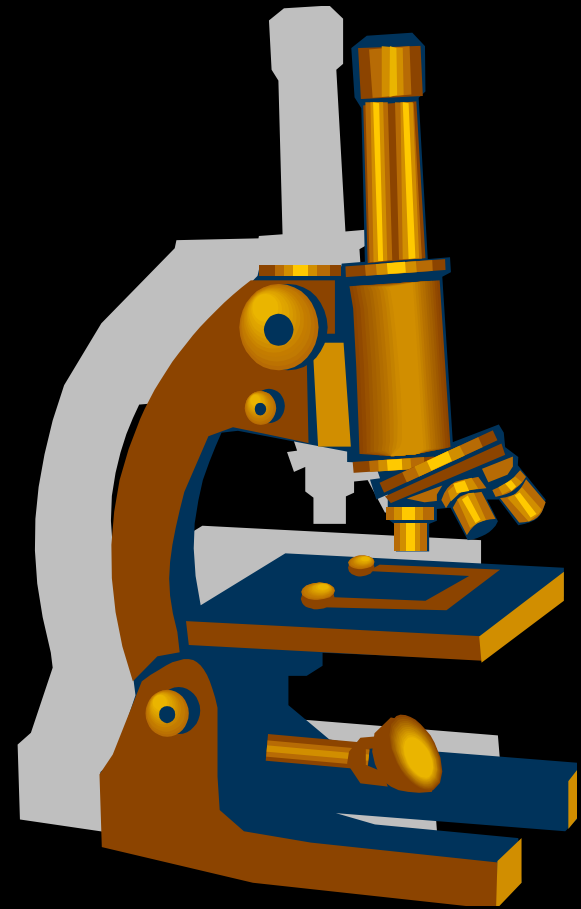
Specific Instances



The Scientific Method

Descartes & Bacon

Based on **logic** and
reason rather than faith –
conclusions
had to be based on
observation (**empiricism**)
and experimentation



Royal Academies

The Scientific Revolution was aided by the development of *Royal Academies* in the seventeenth century.

Established by absolute monarchs for
• Scientific Investigation

Why?

Royal Academies

Better Science = Better Warmaking

Also, Alchemy could make a king rich (for those who believed in it)



Royal Academies

Royal Academies published *journals* so that scientists could communicate.

Others could continue their experiments.
(e.g., Copernicus → Galileo)



Louis XIV at the French Academy of Sciences



Louis XIV visiting the Royal Academy



The Limits of Reason...

Can God's existence be established through empirical methods?



Pascal's Wager



Blaise Pascal
French Mathematician



"God is, or He is not."

BLAISE PASCAL

- Pascal's *Wager* is an attempt to justify belief in God not with an appeal to evidence for his existence but rather with an appeal to self-interest. ***It is in our interests to believe in the God of Christianity.***
- If we believe in the Christian God, the argument runs, then if he exists then we will receive an infinitely great reward in heaven while if he does not then we will have lost little or nothing

Witch Hunts

The Continuing Influence of Superstition



80% Women



1400-1700

***70,000 and 100,000 “witches”
burned in Europe***



Witches
Switzerland, 16th c.